Name: Date: Period:

**Genetics/Meiosis/DNA Unit**

1. **heredity** – passing of \_\_\_\_\_\_\_\_\_\_\_\_\_ from \_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_

2. **examples of** **traits** –

3. **genetics** -- study of how \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from \_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. **Gregor Mendel** -- \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; used \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ to study \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1st experiment – performed pea plant \_\_\_\_\_\_\_\_\_\_\_\_\_\_ for 7 different \_\_\_\_\_\_\_\_\_

5. **offspring** -- \_\_\_\_\_\_\_\_\_\_\_\_\_ generation from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. **genes** – sections of \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. **alleles** – different \_\_\_\_\_\_\_\_\_\_\_ of a \_\_\_\_\_\_\_\_\_\_\_\_ (letters)

8. **dominant** -- allele that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (capital letter)

9. **recessive** – allele that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (lowercase letter)

10. **Punnett Sqare** – tool used to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ all possible \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ combinations

11. **probability** – mathematical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that an \_\_\_\_\_\_\_\_\_\_\_\_ will occur

12. **genotype** -- \_\_\_\_\_\_\_\_\_ displayed (BB, Bb, bb)

13. **phentoype** – organism’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (brown, blonde, or black hair)

14. **heterozygous** -- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ alleles (Bb)

15. **homozygous** -- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ alleles (BB, bb)

Genes still a mystery! Must understand **REPRODUCTION**!

Two types:

1. **asexual reproduction** – 1 \_\_\_\_\_\_\_\_\_\_\_ cell needed to produce \_\_\_\_\_\_\_\_\_\_\_\_\_ cells or copies
2. **sexual reproduction** – 2 \_\_\_\_\_\_\_\_\_\_\_\_\_ cells join together to form new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. **parent cells** = \_\_\_\_\_\_\_\_\_\_\_\_ cells
   2. **meiosis** – cell \_\_\_\_\_\_\_\_\_\_\_\_\_ that produces sex cells (sperm or egg)
      1. females receive 2 \_\_\_\_\_\_\_\_\_
      2. males receive 1 \_\_\_\_ and 1 \_\_\_\_\_

Genes & DNA

Genes must:

1. supply \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and building cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. be able to be \_\_\_\_\_\_\_\_\_\_\_\_\_

Genes made of \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**DNA Structure** = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* **Make-up** = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ backbone
  + **Nucleotides** = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + **A** pairs with \_\_\_\_\_\_\_
  + **C** pairs with \_\_\_\_\_\_\_
* **To copy, must** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_

How DNA Works:

* Reads like a \_\_\_\_\_\_\_\_\_\_\_\_
* 3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ code for an \_\_\_\_\_\_\_\_\_\_\_\_ acid
  + \_\_\_\_\_\_\_\_\_\_\_\_ acids form \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to give us \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Problems with DNA:

* **mutations** – change in \_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in DNA
  + **base pair replaced, base pair added, base pair removed**
* Mutations lead to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Down syndrome)

Ways to get around gene issues!

1. **Pedigrees** – tools for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a trait through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the family
2. **Selective breeding** – mating organisms with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ traits to receive the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ gene
3. **Genetic engineering** – transfer \_\_\_\_\_\_\_\_\_\_\_\_ from one organism to \_\_\_\_\_\_\_\_\_\_\_\_\_
4. **Cloning** – creating an \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Pedigree Symbols:

Name: KEY Date: Period:

**Genetics/Meiosis/DNA Unit**

1. **heredity** – passing of traits from generation to generation

2. **examples of traits** – blue eyes, brown hair

3. **genetics** -- study of how genes are passed from generation to generation

4. **Gregor Mendel** -- father of genetics; used pea plants to study genetics

* 1st experiment – performed pea plant crosses for 7 different traits

5. **offspring** – 1st generation from cross

6. **genes** – sections of DNA and protein on a chromosome

7. **alleles** – different forms of a gene

8. **dominant** -- allele that is strongest (capital letter)

9. **recessive** – allele that is hidden (lowercase letter)

10. **Punnett Sqare** – tool used to predict all possible genetic combinations

11. **probability** – mathematical chance that an event will occur

12. **genotype** – trait displayed (BB, Bb, bb)

13. **phentoype** – organism’s appearance (brown, blonde, or black hair)

14. **heterozygous** -- different alleles (Bb) synonym -- hybrid

15. **homozygous** – same alleles (BB, bb) synonym -- pure

Genes still a mystery! Must understand **REPRODUCTION**!

Two types:

1. **asexual reproduction** – 1 parent cell needed to produce identical cells or copies
2. **sexual reproduction** – 2 parent cells join together to form new individuals
   1. **parent cells** = sex cells
   2. **meiosis** – cell division that produces sex cells (sperm or egg)
      1. females receive 2 X’s
      2. males receive 1 X and 1 Y

Genes & DNA

Genes must:

1. supply instructions for cell processes and building cell structures
2. be able to be copied

Genes made of DNA and protein

**DNA Structure** = double helix

* **Make-up** = nucleotides + sugar-phosphate backbone
  + **Nucleotides** = adenine, thymine, guanine, and cytosine
  + **A** pairs with T
  + **C** pairs with G
* **To copy, must** split in half

How DNA Works:

* Reads like a book
* 3 nucleotides code for an amino acid
  + Amino acids form proteins to give us traits

Problems with DNA:

* **mutations** – change in order of nucleotides in DNA
  + **base pair replaced, base pair added, base pair removed**
* Mutations lead to genetic diseases (Down syndrome)

Ways to get around gene issues!

1. **Pedigrees** – tools for tracing a trait through generations of the family
2. **Selective breeding** – mating organisms with desired traits to receive the desired gene
3. **Genetic engineering** – transfer genes from one organism to another
4. **Cloning** – creating an exact copy

Pedigree symbols: